THE BASAL METABOLIC RATE IN ACNE VULGARIS*

An Analysis of 353 Determinations

STUART C. SMITH, M.D., C. JACK YOUNG, M.D. AND DUDLEY C. SMITH, M.D.†

Acne vulgaris is a chronic inflammatory disease involving the pilosebaceous structures of the skin. A single cause cannot usually be found, but there is rather a combination of any number of the following etiological factors: endocrinological, nutritional, medicinal, hereditary, toxic, infectious, allergic and psychic. Any finding, either clinical or laboratory, which occurs consistently, then, would be of particular significance in establishing the correct approach to the management of this disease.

In recent years the theory that acne vulgaris is a pustular lipoidosis resulting from a disturbance in fat metabolism and which frequently presents the picture of mild hypothyroidism has been proposed. Widespread acceptance of this idea has not been forthcoming. This study is undertaken, therefore, in order to determine whether or not there is a tendency toward hypothyroidism in acne vulgaris as measured by the basal metabolic rate.

METHOD

From 1939 through 1948 an attempt to include a basal metabolism test in the medical evaluation of every patient with acne vulgaris was made. For various reasons success was not met with in every instance, but during this ten year period a basal metabolic rate was determined on 353 patients with varying degrees of severity of acne vulgaris. These patients were classified as mild, when comedones and 1 to 15 superficial papules were present; moderate, when deep papules and pustules were present and severe, when cystic or nodular lesions were evident.

Numerous errors are inherent in the standard procedure for obtaining a basal metabolism test. Every effort was made to eliminate factors that might cause a discrepancy in the results. The majority of the determinations were done in the same laboratory under the direction of one technician. Whenever, for any reason, an error was suspected, repeat determinations were made immediately and the lowest value considered the correct reading for that particular test. If more than one basal metabolic rate was obtained on a patient, an average value of all the separate tests was taken for purposes of calculation. All patients were instructed carefully in regard to preparations for the test. Readings between −10 and +10 per cent were considered within the normal limits in our laboratory.

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* From the Department of Dermatology and Syphilology, University of Virginia School of Medicine and Hospital.

† Deceased August 30, 1950.

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RESULTS

A basal metabolic rate was obtained on 353 patients with acne vulgaris (table 1). In 195 patients (55.2 per cent) it was within normal limits. In the group of

TABLE 1

Distribution of cases according to severity and basal metabolic rate

ACNE VULGARIS	NUMBER OF CASES	BMR ±10	BMR <− 10	BMR >+10
Mild	114	63	50	1
Moderate	175	94	75	6
Severe	64	38	25	1
Total	353 (100%)	195 (55.2%)	150* (42.5%)	8* (2.3%)

* This is a ratio of 18.75:1.

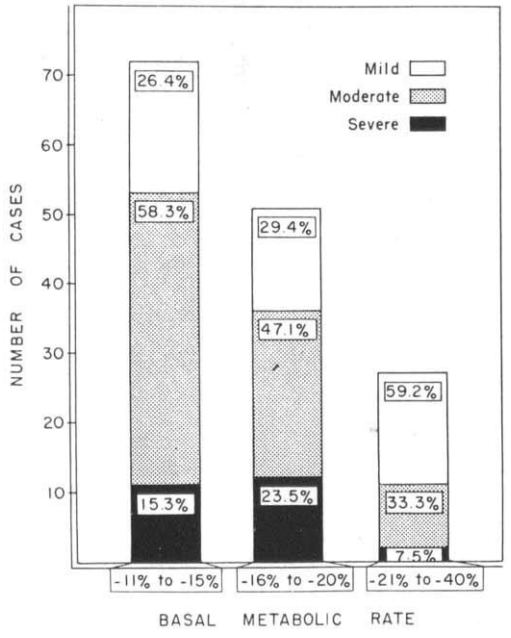

FIG. 1. Distribution of cases of acne vulgaris within each −5 per cent basal metabolic rate.

abnormal basal metabolic rates, 150 patients (42.5 per cent) had a rate less than −10 per cent and 8 patients (2.3 per cent), a rate greater than +10 per cent. The significance of these results will be discussed later.

In this study the ratio of abnormal negative to abnormal positive basal metabolic rates was 18.75:1.

Figure 1 illustrates graphically the relationship between negative basal metabolic rates and the number of cases in each diagnostic classification of mild, moderate and severe acne vulgaris. No direct relationship between the severity of the disease and the degree of negativity of the basal metabolic rate can be said to exist, but there does seem to occur an almost constant distribution of cases in each classification with each −5 per cent reduction in the basal metabolic rate.

DISCUSSION

There is not general agreement as to the value of including a basal metabolism test in the evaluation of a patient with acne vulgaris. At least two authorities pay no attention to the results or even have a determination done (1, 2). Our basis for determining the basal metabolic rate stems from the theory proposed by one author (1) that, among other changes, there is a disturbance in fat metabolism in these patients and from the clinical observation that there is improvement in the condition when thyroid extract is administered. No attempt is made in our study to evaluate the effect of the administration of thyroid extract either on the clinical condition of the patient or on the basal metabolic rate.

In a review of the literature on acne vulgaris only one article could be found in which the investigators attempted to obtain routinely a basal metabolic rate (3). These determinations were gleaned from a metabolic study of various dermatoses. They found that of 34 patients, 22 (65 per cent) had an abnormal negative basal metabolic rate, and 12 (35 per cent) had a normal rate. Unfortunately the limits of normal are not defined. The discrepancy between the percentage results in their group and in ours most likely lies mainly in the smaller number of patients studied by them. There remains, however, agreement with the general tendency toward hypothyroidism as determined by use of the basal metabolism test. No attempt was made by that group to evaluate the results statistically.

A study of the basal metabolism test on 9868 patients with a non-metabolic disease revealed a basal metabolic rate of less than −10 per cent in 16.1 per cent of that group (4). Using this large number of patients as a control group, the difference between the percentage of basal metabolic rates less than −10 per cent in the control group and in our group was 26.3. When calculated statistically the deviation from the normal is equal to 7.7, a figure much greater than the accepted significant standard deviation of 2. Such a difference appears to be a very real one since such results would occur by chance alone only once in 400,000,000,000 times.

SUMMARY AND CONCLUSIONS

A study of basal metabolism tests performed over a 10 year period on 353 patients with acne vulgaris is presented.

One hundred and fifty-eight patients (44.8 per cent) had an abnormal basal metabolic rate. The rate in 150 patients (42.5 per cent) was less than −10 per cent; the rate in 8 patients (2.3 per cent), greater than +10 per cent.

The ratio of abnormal negative to abnormal positive basal metabolic rates was 18.75:1.

There is no direct relationship between the severity of the disease and the degree of negativity of the basal metabolic rate.

A statistical analysis of the group studied and a large control group proved that the results are significant.

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